

REMARKS

This Amendment, Response, and Request for Continued Examination Pursuant to 37 CFR 1.114 is being submitted in response to the Advisory Action mailed March 14, 2007, and the final Office Action mailed January 18, 2007. Claims 1-15 are pending in the Application.

Claims 1, 3, 5-9, and 13-15 are rejected under 35 U.S.C. §103(a) as being unpatentable over Arecco *et al.* (U.S. Patent No. 7,072,580 B2) in view of Elie-Dit-Cosaque *et al.* (U.S. Patent Application Pub. No. 2004/0246892 A1). Claims 2, 4, 10, and 12 are rejected under 35 U.S.C. §103(a) as being unpatentable over Arecco *et al.* and Elie-Dit-Cosaque *et al.* as applied to Claims 1, 3, 5-9, and 13-15, and further in view of Cadeddu *et al.* (U.S. Patent No. 5,647,035).

In response to these rejections, Claims 1, 7, and 8 have been amended to further clarify the subject matter which Applicants regard as the invention, without prejudice or disclaimer to continued examination on the merits. These amendments are fully supported in the Specification, Drawings, and Claims of the Application and no new matter has been added. Based upon the amendments, reconsideration of the Application is respectfully requested in view of the following remarks.

Rejection of Claims 1, 3, 5-9, and 13-15 under 35 U.S.C. §103(a) - Arecco *et al.* and Elie-Dit-Cosaque *et al.*

Claims 1, 3, 5-9, and 13-15 are rejected under 35 U.S.C. §103(a) as being unpatentable over Arecco *et al.* (U.S. Patent No. 7,072,580 B2) in view of Elie-Dit-Cosaque *et al.* (U.S. Patent Application Pub. No. 2004/0246892 A1).

In the Advisory Action, Examiner states that Applicants' argument that the invention differs from Arecco *et al.* because it does not distribute protection switching to

each node with affected traffic is not persuasive because it is not recited in the claims. Applicants have amended independent Claims 1 and 8 to include this limitation regarding protection switching. Specifically, Claim 1 has been amended to recite:

1. A method of maintaining a network connection in an optical network, the optical network including a plurality of switching nodes and an egress switching node, a plurality of spans including working and protecting fibers operatively connecting the switching nodes, and carrying a plurality of channels, the method comprising:
 - obtaining channel assignment data including the channels assigned to the network connection on each of the plurality of spans used by the network connection;
 - propagating the channel assignment data to the switching nodes in the optical network;
 - storing, at the switching nodes, the channel assignment data;
 - monitoring the optical network for a failed span and notifying the optical network in response to the failed span, wherein the switching nodes perform a *line* switching operation in response to the notification in order to switch the network connection to the protecting fiber, **and wherein the line switching is performed between two nodes of the plurality of switching nodes adjacent to the failed span;**
 - determining which channel the network connection utilized on the failed span based on the channel assignment data and the notification of the failed span; and
 - dropping the channel selected by said determining step from the protecting fiber at the egress switching node.

Applicants note that the protection switching of Applicants' invention is a line switching operation only between the nodes adjacent to the failed span, and not switching distributed to all nodes with affected traffic. Subsequent to the protection switch, Applicants determine which channel the network connection utilized responsive to the channel assignment data, and drop this channel at the egress switching node.

Arecco *et al.* teaches "a network ring of a known type under normal conditions, failure condition with a multiplex section shared protection and failure condition with a multiplex section shared protection--transoceanic application."¹ FIG. 1c of Arecco *et al.* teaches an "MS shared protection ring--transoceanic application" in the Annex A of the Telecommunication standard ITU-T Recommendation G.841.²

¹ U.S. Patent No. 7,072,580, Col. 10, lines 28-31

² U.S. Patent No. 7,072,580, Col. 3, lines 56-60

Applicants submit this is different from the present invention. Arecco *et al.* operates by distributing the protection switching to all nodes with affected traffic (i.e. the ingress nodes), rather than only at the two nodes adjacent to the failure.³ Therefore, Arecco *et al.* operates only at the ingress nodes to switch traffic affected by the failure to the protection link. Basically, G.841 Annex A describes switching traffic affected by a failed span to a protection fiber at the traffic's source node. This overcomes loopback conditions that occur with line switching. Applicants switch traffic with a line switch between nodes adjacent to the failed span, and subsequently drop traffic at the egress nodes from the protection link responsive to a channel assignment database after a protection switch.

Applicants respectfully note that Arecco *et al.* focuses on the ingress node for the protection switching of affected traffic, while Applicants focus on the egress node following a protection switch to drop channels responsive to a channel assignment database.

Arecco *et al.* specifically states:

In brief, a failure is detected at the two nodes adjacent to the failure at the SDH multiplex section layer and, subsequently, the nodes terminating failed links are informed of the failure situation and re-route the corresponding links on the complementary ring arc path, as illustrated in FIG. 1c. In other words, in case of failure, all the transmission links affected by the ***failure are bridged at their source nodes*** onto the protection channels that travels away from the failure. When the affected links reach their final destination nodes, they are switched to their original drop point. Therefore, no loopbacks are established and there is no risk of having, in case of failure, restoration transmission paths crossing more times the ocean.⁴ (emphasis added)

Applicants' invention differs from Arecco *et al.* because it does not distribute protection switching to the source nodes with affected traffic; rather it allows the egress

³ *The TPC-5 Cable Network*, Barnett *et al.*, IEEE Communications Magazine, February 1996, p. 39 (available at <http://www.comsoc.org/ci/private/1996/feb/pdf/Barnett.pdf>)

⁴ U.S. Patent No. 7,072,580, Col. 3, lines 60-67 and Col. 4, lines 1-5

node to drop the affected channels off the protecting fiber directly instead of receiving it off the working fiber (which could require a longer optical pathway). Applicants' dropping step is performed subsequent to a switching operation, and it utilizes the channel assignment database. Arreco *et al.* teach bridging all transmission links affected by a failure at their source nodes onto protection channels and switching them back to the original drop point at the destination node. This specifically does not teach or suggest dropping channels from a protecting fiber after a switching operation. Accordingly, Applicants submit that FIG. 1c does not teach Applicants' invention.

Examiner states that Elie-Dit-Cosaque *et al.* teach in FIG. 3a and FIG. 3b to store channel assignment in a database.⁵ Applicants submit that Elie-Dit-Cosaque *et al.* teach the database for calculating working paths and protection paths using weighted criteria.⁶ While the combination of Arreco *et al.* and Elie-Dit-Cosaque *et al.* teach an optical network with a database, the combination does not teach utilizing the database to enhance optical switching algorithms by dropping channels affected by a failure directly from a protecting fiber.

The prior art reference (or references when combined) must teach or suggest all claim limitations.⁷ Specifically, Applicants respectfully submit that the combination does not disclose the determining and dropping steps in Claim 1, and a controller in Claim 8 configured to drop a selected channel from the protecting fiber in response to a switch by access the channel database.

Therefore, Applicants respectfully submit that the rejection of Claims 1, 3, 5-9, and 13-15 under 35 U.S.C. §103(a) as being unpatentable over Arecco *et al.* in view of Elie-Dit-Cosaque *et al.* has now been overcome and respectfully request that this rejection be withdrawn, these claims being otherwise allowable.

⁵ See Final OA, p. 3

⁶ U.S. Patent Appl. No. 2004/0246892A1, FIG. 4

⁷ M.P.E.P. §706.02(j)

Rejection of Claims 2, 4, 10, and 12 under 35 U.S.C. §103(a) - Arecco *et al.*, Elie-Dit-Cosaque *et al.*, and Cadeddu *et al.*

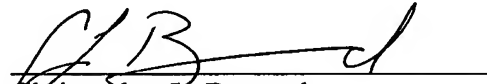
Claims 2, 4, 10, and 12 are rejected under 35 U.S.C. §103(a) as being unpatentable over Arecco *et al.* and Elie-Dit-Cosaque *et al.* as applied to Claims 1, 3, 5-9, and 13-15, and further in view of Cadeddu *et al.* The arguments presented above apply with equal force here. Therefore, Applicants respectfully submit that the rejection of Claims 2, 4, 10, and 12 under 35 U.S.C. §103(a) as being unpatentable over Arecco *et al.* and Elie-Dit-Cosaque *et al.* as applied to Claims 1, 3, 5-9, and 13-15, and further in view of Cadeddu *et al.*, has now been overcome and respectfully request that this rejection be withdrawn, these claims being otherwise allowable.

CONCLUSION

Applicants would like to thank Examiner for the attention and consideration accorded the present Application. Should Examiner determine that any further action is necessary to place the Application in condition for allowance, Examiner is encouraged to contact undersigned Counsel at the telephone number, facsimile number, address, or email address provided below. It is not believed that any fees for additional claims, extensions of time, or the like are required beyond those that may otherwise be indicated in the documents accompanying this paper. However, if such additional fees are required, Examiner is encouraged to notify undersigned Counsel at Examiner's earliest convenience.

Respectfully submitted,

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Christopher L. Bernard
Registration No.: 48,234

Lawrence A. Baratta Jr.
Registration No.: 59,553

Attorneys for Applicants

CLEMENTS | WALKER
1901 Roxborough Road, Suite 300
Charlotte, North Carolina 28211 USA
Telephone: 704.366.6642
Facsimile: 704.366.9744
cbernard@worldpatents.com